Beverly Allitt: the nurse who killed babies

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I was in Glasgow on 15 May 1991 when I was called to the telephone to speak to the police. I had no idea what it was about and my anxiety level was high. My caller, who introduced himself as Superintendent Stuart Clifton of Grantham Police, quickly allayed my worst fears. NovoNordisk Ltd, the largest suppliers of insulin in the country, had given him my name as someone who could help him measure insulin in blood and interpret the results. Superintendent Clifton told me that he was investigating the possibility of multiple murders in Grantham Hospital and that insulin might have been used as the murder weapon – but they were still a long way off having a cast-iron case. We arranged to meet a week later in Grantham.

I arrived in Grantham as arranged, and at about 6 pm Superintendent Clifton arrived with three other men, part of his team of policemen and women investigating what they believed to be one of the biggest multiple murder cases ever to have arisen in Britain.

It emerged that although the police believed there had been serious wrongdoing in the paediatric ward at Grantham Hospital (Ward 4), and that although someone had been suspended on suspicion, the evidence was still far from conclusive. Everything that had happened, they had been advised, could have been due to an unhappy sequence of natural but tragic events.

The story they told me was fascinating but incomplete. I gave the assembled group some advice as to what further investigations needed to be carried out to fill in the gaps. These were mainly on specimens of blood plasma that had been collected from the various victims and which were being stored in refrigerators in Grantham and other nearby hospitals. Arrangements were made to deliver them for analysis to Dr Teale at the Guildford laboratory specialising in the investigation of obscure causes of hypoglycaemia, which I had set up some 20 years before.

The results when they were obtained were dynamite; Superintendent Clifton was convinced he had a powerful case, but was less certain that all the experts he had consulted until then, mostly pathologists and paediatricians, would go along with him. He arranged to hold a conference to which everyone who had been involved in the case was invited.

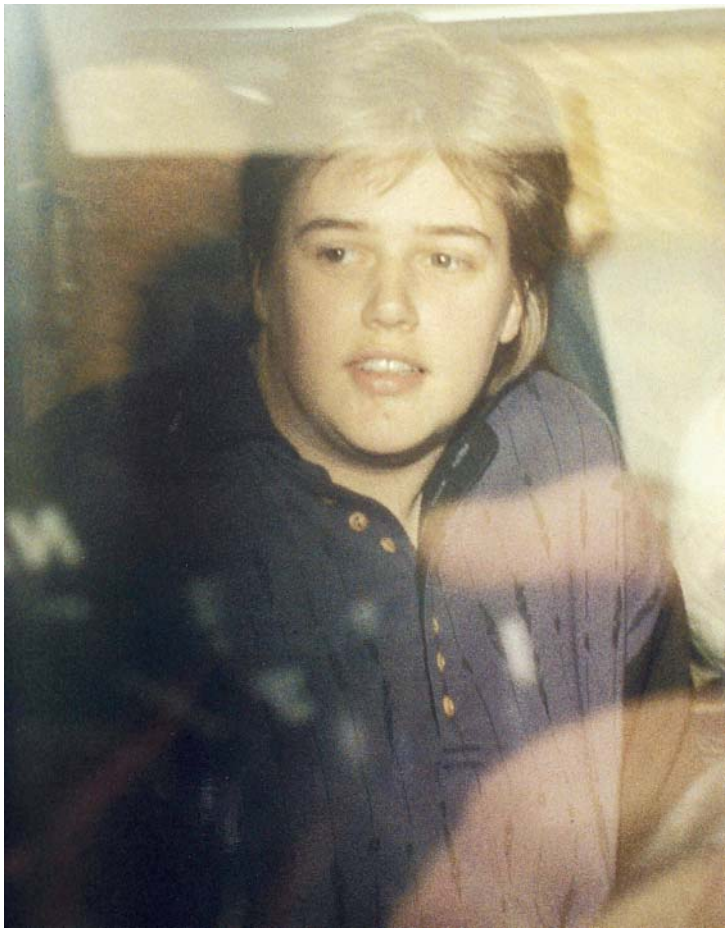
The conference was attended by 60 or more people – about half of them from the police, with the remainder from various health institutions. There were 10 or so outside experts who were there to address one aspect or another of child health, a number of nurses and doctors who had been involved with the care of one or more of the children, and a phalanx of clerks, managers and administrators.

Superintendent Clifton introduced the subject that had first been brought to police attention on Tuesday 30 April 1991. Two events prompted the call to police by the Grantham Hospital authorities. One was a meeting, in late April, of a group of junior doctors at the Queen's Medical Centre (QMC) in Nottingham who had become concerned at the large number of sick children they had received for specialist care from Grantham Hospital during the previous two months. Whereas previously they had received two or three seriously ill children a year from Grantham, which used QMC Nottingham as its tertiary referral centre, more than twice that number had been referred in just eight weeks. As a result they concluded that something was amiss in Grantham and communicated their fears to Professor, now Sir, David Hull, the Professor of Paediatrics. He informed the managers at Grantham of their concerns and implied that if they did not call the police, he would.

Consultant child care at Grantham was provided by two consultants, Dr Frederick Porter and

Authors of the RSM Press book *Insulin Murders*

Figure 1
Beverly Allitt



Dr Charithananda Nanayakkara, each working independently. Some eleven days before Professor Hull's call, Dr Porter had expressed similar concerns. Dr Nanyakkara, however, remained to be convinced that the hospital was suffering from anything more than a run of bad luck and poor facilities.

I learned from Superintendent Clifton that the police had built up a case against Beverly Allitt, who was the only person connected with all of the 13 cases they suspected had been deliberately caused. The first hurdle they had to overcome, however, was establishing not who the criminal was, but whether there was any crime at all. Dr Porter was pretty sure there was, at least as far as baby Paul Crampton was concerned. Dr Nanayakkara's view, on the other hand, was shared by many of the other experts the police had consulted, because, individually, there was nothing specifically that pointed to illness from an unnatural cause. It appeared that almost no one except me was prepared at the beginning of the conference to stick their neck out and say that foul play had definitely been committed on Ward 4. I did this on the basis of the Guildford findings in the case of baby Paul, who had been injected with a huge dose of insulin on three or more occasions.

Once the ice had been broken others joined in, and by about 5 pm the police knew they had a case. So it seems did the press, who had gathered in force outside the conference hall at the hospital. It was, however, not until two months later, on 3 September, that Allitt was arrested on suspicion of murdering Becky Phillips, one of identical twin babies who were 6 weeks old. Even so the police had to let her go. Another two months elapsed before the evidence was sufficiently strong to charge her with murder. A lot of people put in a great deal of work between my conference with Superintendent Clifton in May and Allitt's arrest in November when she was charged with murder, but there was still more to be done.

I submitted the first of my many expert witness statements on 6 September 1991. It ran to 28 pages of typescript and dealt with just four of the 19 cases whose case notes had been delivered to my office for detailed analysis. The total amount of documentation occupied seven feet of shelf space. The case notes on six patients were, after thorough examination, dismissed as being far too tenuously linked to any potential deliberate harm to warrant further investigation. The four cases I concentrated on, because I felt that they fell largely within my area of expertise, included Paul Crampton, who fortunately survived physically unscathed, and Claire Peck, Becky Phillips and Liam Taylor, three of the children Allitt was finally convicted of murdering in May 1993.

The investigation

From the death of Claire Peck, the last known to be caused by Allitt, until the police arrived on the scene, nothing dramatic – apart from a mysterious fire in a mattress on Ward 4 on 29 April – seemed to happen at Grantham Hospital. Behind the scenes, however, the junior doctors at QMC Nottingham and Drs Porter and Nanayakkara at Grantham were all doing their bit to get the nursing and management authorities to take the escalating number of untoward events occurring in the hospital seriously. Eventually, on 30 April, the police were called in, and on 1 May Superintendent Clifton visited the hospital for the first time. He recognized immediately the need for action, and by examining the duty rosters

identified Allitt as the prime suspect. She was suspended from duty.

This suspension did not prevent her from seeking and obtaining other jobs both within and outside the NHS, where she continued to wreak havoc until she was arrested for the last time and kept in custody in November 1991, more than nine months after the death of the first baby she murdered and 24 months before she was tried and found guilty of the murder of four children, the attempted murder of another three, including Paul Crampton, and inflicting grievous bodily harm on a further six children. She was also accused, after she left Grantham Hospital, of attempting to murder a 14-year-old boy, Jonathan Jobson, with the blood sugar- lowering drug glibenclamide, and an elderly inmate of a residential home, Mrs Dorothy Lowe, with insulin, but at her trial there was insufficient evidence to convict her on these charges.

During the 24 months that elapsed between suspicion falling on Allitt and her coming to trial an enormous amount of effort was put in by the police and the experts they called to advise them. With the benefit of hindsight the whole scenario seems obvious, but it certainly was not at the time. It had to be demonstrated first that the events that took place on Ward 4 at Grantham Hospital could not have been due to natural causes and an unusual run of extremely bad luck, and second that if there really was foul play going on, only Allitt could be the culprit.

By the time I was consulted, the police had, by examining the nursing time sheets, established statistical evidence linking Allitt with each of the suspect hospital cases. There was a remarkable coincidence between the times when she was on duty and the occurrence of unexpected events in all 13 children. The chance of this being coincidence was calculated to be less than one in 10 million. In ten of the cases, the child's illness could have had a perfectly natural explanation – and even in the cases of Paul Crampton, Claire Peck and Becky Phillips there was an extremely remote possibility that the damage was accidental. It was only when all the cases were taken together and had been investigated in greater detail than had originally been considered necessary for clinical purposes that the whole thing fell into place.

Paul Crampton's hypoglycaemia was the first incident to be investigated with a rigour that could withstand scrutiny in the witness box. The blood sample that revealed what Allitt was up to was the one collected during Paul's third attack of hypoglycaemia on 28 March 1991, before he was treated with intravenous glucose and sent off to QMC Nottingham. An earlier specimen, collected on 25 March and sent to the supraregional insulin assay laboratory at Hammersmith Hospital in London, had produced a normal result. This was scarcely surprising, since Paul's blood glucose level was normal at the time and so occasioned no comment from the laboratory. C-peptide was neither asked for nor measured on that specimen but would almost certainly have also been normal. Paul's second plasma sample had been sent to the supraregional assay laboratory in Cardiff, this time with a request for both insulin and C-peptide assay.

Dr Porter had, by the time of Paul's second episode of hypoglycaemia, become suspicious that it might be due to a rare but very interesting abnormality of the pancreas that occurs almost exclusively in children. This condition, known as nesidioblastosis, produces an illness very similar to that of islet cell tumour or insulinoma in adults. It is characterized by hypoglycaemia produced by excessive release of both insulin and C-peptide from the patient's own pancreas. Diagnosis, once suspected, is pretty straightforward and seldom very urgent since the emergency treatment of hypoglycaemia is the same whatever its cause. Nesidioblastosis is characterized by the presence of high plasma insulin and C-peptide levels even when the blood glucose concentration is low. A high plasma C-peptide level serves to distinguish a high pancreatic insulin level from one equally high but produced by pharmaceutical insulin, which does not contain C-peptide.

Owing to Good Friday and Easter Monday, Paul's plasma sample did not arrive in Cardiff until 4 April, and it was not dealt with until the next batch of tests was set up routinely on 12 April. By this time Paul had not only left Grantham Hospital but also QMC Nottingham, and was home with his parents. Dr Rhys John, who performed the assay, did not know this, however, and because the results were so abnormal he had phoned them through to Dr Porter in Grantham. The insulin level was so high that it went beyond the measuring scale used in Cardiff. The plasma C-peptide level, on the other hand, was so low that it could not be detected.

What then happened is described in some detail in the Clothier Report, the official report on the Allitt murders, which pointed out that Dr Porter, not being an expert on hypoglycaemia, tried to get in touch with Dr Johnson, the paediatrician who had looked after Paul while he was in QMC

Nottingham. Dr Johnson happened to be away and so was unable to help interpret the results. Even so, Dr Porter was suspicious that Paul's hypoglycaemic attacks might have been caused by deliberate or possibly accidental insulin administration rather than by nesidioblastosis. He communicated his misgivings to Mrs DM Onions, the nurse manager of Ward 4, who in turn communicated Dr Porter's misgivings about the plasma insulin and C-peptide results to the police, and this was how I became involved.

It transpired in late May, when I had my first meeting with Superintendent Clifton, that my former laboratory in Guildford had received two samples of blood plasma collected from Paul whilst he was still in QMC Nottingham. These had arrived on 10 May and been regarded as routine samples, since there was nothing about them or the request form that accompanied them to suggest otherwise. They were analysed for their glucose, insulin and C-peptide content in the ordinary way. The blood glucose, insulin and C-peptide concentrations in both samples were all perfectly normal. The significance of this only became apparent later, when the results of tests carried out on samples of Paul's blood collected while he was suffering from hypoglycaemia on 28 March became available.

After my telephone conversation in Glasgow, Superintendent Clifton arranged for the remainder of the sample that had been sent to Cardiff and stored in their deep freeze to be collected and delivered to Dr Teale in Guildford. It arrived still deep-frozen in the capable hands of Detective Inspector Jones from Lincolnshire Police, and was duly analysed by a laboratory technician working under the direct supervision of Dr Teale. Like Dr Rhys John in Cardiff, Dr Teale found the insulin content of the sample to be so high that it was off the scale of measurement. He did not stop there, however, but proceeded to measure insulin in carefully diluted samples of the original plasma specimen. The concentration in a sample that had been diluted 1 in 1600 was a staggering 207 pmol/L – equivalent to the astronomically high concentration of 331,200 pmol/L in the undiluted original sample. He obtained similar results using smaller dilutions of 1 in 400 and 1 in 800 of the original sample, confirming that it really was insulin that was being measured and not just an artefact resulting from interference in the test procedure.

Dr Rhys John's results were so abnormal as to be outside anyone's experience in Grantham or in Nottingham, and consequently their accuracy and reliability had been viewed with some suspicion. Dr Teale's results not only confirmed but also extended them. Since both he and I, with our greater experience of such things, had seen similar results, we were not altogether surprised by them. They are almost always caused by insulin taken with suicidal intent, and whilst we had never personally encountered a plasma insulin level quite as high as in Paul's case, Rosalyn Yalow, the Nobel Laureate who invented radioimmunoassay, had.

Dr Teale, like Dr Rhys John, could not detect any C-peptide in the sample of blood plasma collected whilst Paul was suffering from hypoglycaemia, nor could he detect any pro-insulin, the molecule from which insulin is made. Pro-insulin can usually be detected and measured in blood when the insulin concentration is very high due to its overproduction by the pancreas, and it therefore acts as a double check on the significance of the absent C-peptide.

Dr Teale also looked for antibodies to insulin. These can sometimes occur in the blood and give rise to erroneously high insulin results. None were present in Paul's blood, so the evidence that Paul had been given a huge dose of insulin was by now overwhelming, especially when combined with all the clinical evidence. It was now necessary to see whether any of the other children Allitt was thought to have damaged had been given insulin. None had been reported to have suffered from hypoglycaemia, and since it is only by lowering the blood glucose level sufficiently to produce brain damage that insulin ever produces harm it did not seem very likely. Nevertheless, a search was initiated to find surviving samples of blood plasma taken from any of the children that would be suitable for insulin testing.

The first sample to be received in Guildford from the Grantham children after the discovery of the very high levels of insulin in Paul Crampton's blood was from Becky Phillips. It had been collected soon after her arrival at Grantham Hospital on the morning of 5 April 1991, where she was certified dead, probably – it was thought at the time – from sudden infant death syndrome (SIDS). Superintendent Clifton was told the results of the insulin assays on Becky's blood on 18 June, and they confirmed in his mind that he was dealing with a serial murderer, though the evidence as to the murderer's identity was still far from complete. Inspector Jones was assigned the task of tracking down further specimens of serum remaining tucked away in deep freezers from other children who were suspected of being Allitt's victims. On

25 June he delivered samples from five of them to the Guildford laboratory, including some from Becky's twin Katie. Dr Teale diluted the samples, as he was expecting to find high insulin levels. However, both the insulin levels and the C-peptide levels were normal, ruling out the possibility of malicious insulin administration.

Amongst the five samples was one collected from Claire Peck immediately after her death and containing evidence of the abnormally high concentration of potassium that killed her. Dr Porter had originally sent this sample to the Cardiff laboratory for insulin and C-peptide analysis on 25 April. Dr Rhys John had reported that, although it contained a large amount of insulin – 1175 pmol/L – it also contained substantial amounts of C-peptide (1000 pmol/L). This effectively ruled out the possibility that the insulin had been injected or that Claire had been suffering from hypoglycaemia immediately prior to her death. Dr Teale obtained an almost identical C-peptide result to that obtained in Cardiff, but there wasn't enough blood for him to measure its insulin content.

A possible explanation for the high insulin and C-peptide levels in Claire's case was stimulation of insulin secretion by a combination of the aminophylline and salbutamol, which she had been given legitimately for her asthma. Both drugs are known to stimulate insulin secretion by the pancreas. Under some conditions intravenous potassium chloride – which Allitt had given her illicitly – can also do this, and may have been a contributory factor.

A potential red-herring introduced into the cause of Claire's death was the finding of lidocaine in the blood sample collected at 8.45 pm, half an hour after her death. Lidocaine is a local anaesthetic, which, in much larger doses, is used to correct irregularities of the heart beat. The amount found, 5.8 µmol/L, was just below the optimum concentration for use as a cardiac drug, but how it got into Claire's blood remained a mystery since Dr Porter had neither prescribed nor given it to her, though in any event, it is extremely unlikely that lidocaine played any role in Claire's death. It nevertheless gave the lawyers something to think and argue about. Could Allitt have given it to her prior to the potassium chloride injection? This is the most likely explanation but impossible to prove. Someone else may have done it and forgotten that they had done so by the time of the trial more than a year after the event. The most likely explanation, however, is that the specimen containing lidocaine came from someone else. In other words, there was a mix-up somewhere between the collection of Claire's blood and the reporting of the lidocaine result. This is exactly the sort of problem the judge in the Dolores Miller case had in mind[1] when he refused to permit the results of some laboratory tests to be given in evidence.

Insulin could only be implicated in one of the other Grantham Hospital cases, and even here the evidence is indirect and not very convincing. Liam Taylor was 7 weeks old when he was admitted to Grantham hospital with a history of coughing, wheezing and sticky eyes on 21 February 1991. An X-ray of his chest revealed that he had pneumonia, for which he was immediately given antibiotics. Two days later, after an apparently uneventful recovery, he suddenly collapsed from what was described as a cardiorespiratory arrest at 4.13 am on 23 February. He did not respond to attempts at resuscitation, and died.

An autopsy conducted by Dr Fagin found, as almost the only abnormality, an enlarged liver stuffed full of glycogen, the storage form of glucose. Excessive deposition of glycogen in the liver is consistent with Liam having been given insulin maliciously, but is far from proof of it. Nevertheless, it is a matter of public record that enlargement of the liver, detected during life and caused by excessive glycogen deposition, was the sole reason that an unrelated case of proven malicious insulin administration to a baby first came to light. In that case, however, the baby's plasma insulin level was measured and was high. In Liam's case there was no serum available to test. Thus, whilst it is possible that Liam's cardiorespiratory arrest was caused by insulin-induced hypoglycaemia, the evidence isn't there. No blood glucose measurements were ever made before Liam's life support machine was switched off. If insulin was involved, it would probably have been given intravenously to produce such a devastating effect so rapidly. This was feasible, as Liam was being given a slow intravenous infusion of glucose, and if a bolus of insulin had been injected into the infusion, it would have produced a rapid fall in his plasma potassium concentration, and this in turn could have caused a cardiac arrest.

Two other cases came to light in which insulin may have played a role between the time Allitt was suspended from Grantham Hospital and her arrest on charges of murder. In neither of them was the evidence of guilt sufficient to convince the jury and she was acquitted of both charges. Allitt was, however, convicted of killing two other children in addition to Claire Peck and Becky Phillips, of attempting to murder three others, including Paul

Crampton, and of causing grievous body harm to another six children on Ward 4 of Grantham Hospital. She received thirteen life sentences.

Exactly how Allitt harmed the children she was convicted of killing, attempting to kill or causing grievous bodily harm to will probably never now be known. Allitt, after an unsuccessful attempt at starving herself to death, has been in Rampton Mental Hospital since her conviction and is expected to remain there for the rest of her life. Meanwhile the damage she has done as probably the most notorious of child killers of modern times lives on. In 1999, eight years after the terrible events in Grantham Hospital, it was announced that the Phillips family had been awarded around £2,000,000 damages to provide for Katie Phillips, Becky's surviving twin, for the rest of her life. Some three years earlier, in a landmark decision, the health authority had agreed to compensate the 12 sets of parents of the children attacked by Allitt during her brief period as an assistant nurse on Ward 4 of Grantham Hospital for the psychological damage they had suffered.

Allitt insisted throughout her trial that she was innocent, but some months after her conviction when she was in Rampton Hospital, she admitted to Superintendent Clifton that she was responsible for three of the murders and six of the assaults. Superintendent Clifton has never revealed which of the 15 cases Allitt admitted to committing, as he thought it would be divisive and unnecessarily distressing to the parents.

Reference

1 Marks V, Richmond C. Dolores Christina Miller, USA: why did she bother to kill a dying man? In: Marks V, (eds) *Insulin Murders.* London: RSM Press; 2007. p. 51–4